

## ABSTRACT OF THE DISCLOSURE

A plane diffraction grating based on surface normal rotation according to the present invention is designed so that the profile of the grooves at a radial area is determined depending on a rotational position of the area about a rotational center defined as a foot of the rotational axis on the surface of the plane diffraction grating. An optical system such as a spectrometer or a monochromator according to the present invention uses such a plane diffraction grating, and requires a special arrangement. The optical system includes: a plane diffraction grating as described above; a mechanism for rotating the plane diffraction grating about the rotational axis; an incidence optical system for casting a converging beam of light on a point of the surface of the plane diffraction grating, where the point is set apart from the rotational center. As the diffraction grating is rotated about the rotational center, the point on which the incident converging beam of light is cast rotates about the rotation center, where the diffracting condition is optimized anywhere around the rotational center or for any scanning wavelength. The surface of the plane diffraction grating can be covered with a multiple-layer coating to improve diffraction efficiency. When such a multiple-layer is coated, the unit thickness of the multiple-layer coating at an area is also determined depending on the rotational position of the area about the rotational center.

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